The Victorian 6502 User Group Newsletter

KAOS

For People Who Have Got Smart

As you will notice by the heading, we are now
into volume 2 and our second year. At the last
meeting, Marion Anear brought along a birthday cake
she had made in the shape of a computer and monitor.
After the usual happy birthdays and candle blowing,
the members present very smartly disposed of the
cake. Fortunately, we managed to get a photograph
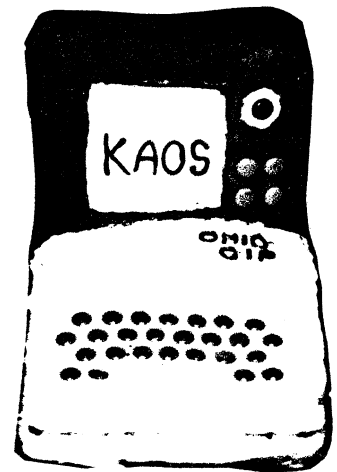for you before it disappeared.

To save us too many more grey hairs, we need a
regular supply of items. It's very bad on the nerves
to have three blank pages the day before the
newsletter is due to be posted. If you are sending
items could you please leave a 25mm border around
the page and use black ink as our copier doesn't
reproduce blue or green very well. This can be handy
if you draw circuit diagrams in black on pale blue
or green graph paper as the grid lines are not
reproduced.

A few words on advertising. As we are an information exchange, we will
advertise anything connected with a 6502 that you want to buy, sell or
exchange. Advertising is free and will be printed in the newsletter in the
order received and as space permits. To avoid disputes all adverts MUST be
in writing and we reserve the right to refuse any advertisement.
CLUB NEWS:

The next meeting will be held at 2pm on Sunday 25th October at the
Essendon Primary School. (Remember daylight saving starts on the 25th, so
don't be late.) Vic Carboon from OTC will be at the meeting to demonstrate
the MIDAS data exchange system. Would the usual early arrivers please note
that the children will be there at 10.30am.

You will see in Rod Drysdale's column, that we have model 15 teletypes
for sale. We can also supply copies of teletype maintenance manuals for
$2.00 each. If you have trouble obtaining paper for your teletype, we can
supply single ply rolls for $10.00 each plus freight. We don't know how long
the rolls are but they are about 8" in diameter.

POWER SUPPLY FOR FLOPPY DISK SYSTEMS

The power supply design shown in the following diagram, was built to power my two 8" Qume drives, which require 24 volts at 1.75 amps. After investigating the possibility of using a 3 terminal regulator it was found to be more advantagious, and cheaper, to use a discrete component regulator, which will deliver 4 amps and therefore over rated for safety.

Rod Irving Electronics supplied this design, which can be adapted for +5v or +12v operation.

Make the following changes
for +5v at 6 to 8 amps.

R1,R2,R8	100 Ω 1/4w
R14	1.5K Ω "
R15	1K Ω "
C1	68,000 uf 16v
	mounted off board
F1	10 amp fuse
ZD1	3.9v 1w
Transformer	8v @ 10 amps
Bridge	MDA 2504 or equiv.
	mounted off board

Make the following changes
for +12v at 4 amps.

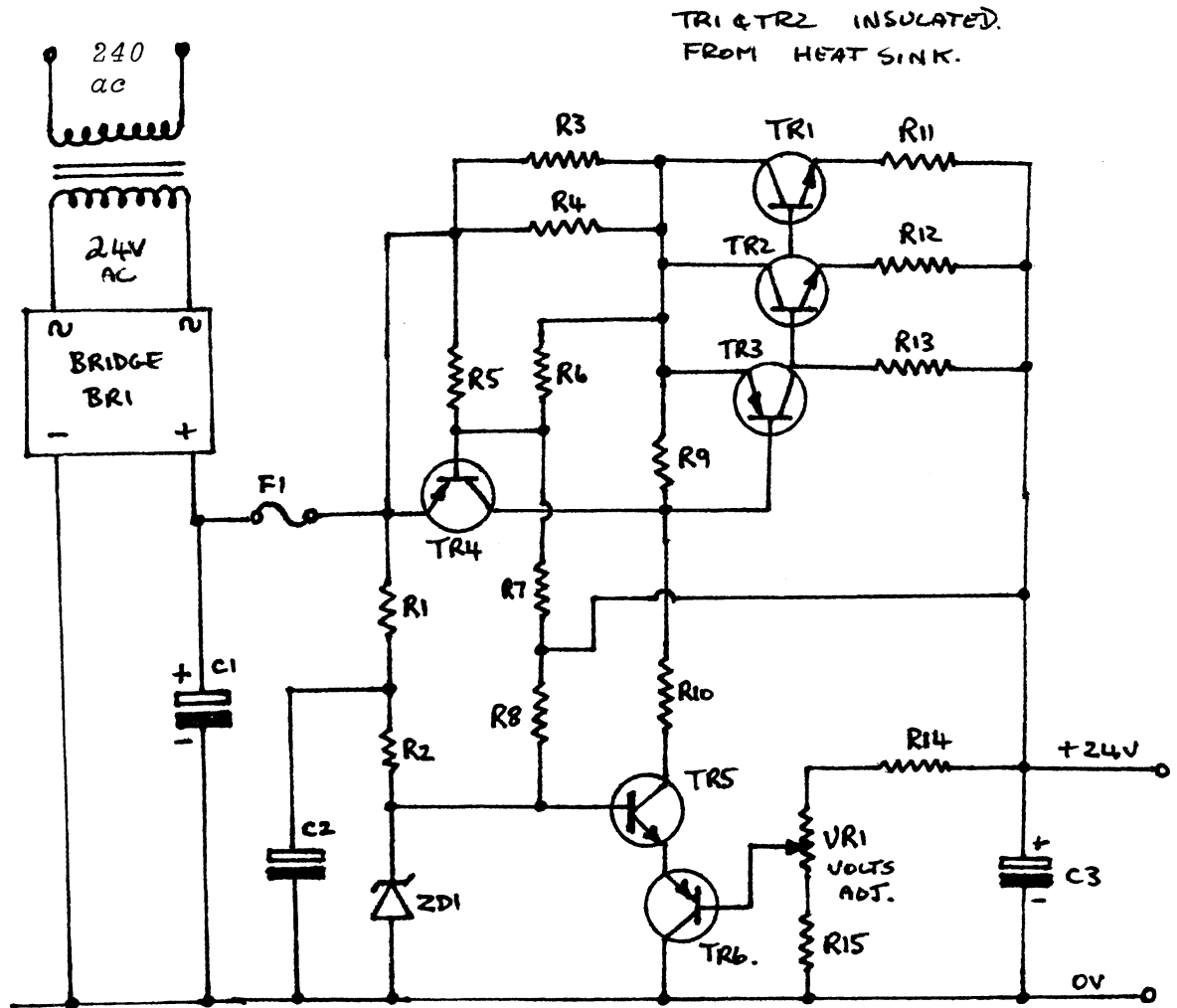|	
R1,R2,R8	470 Ω 1/4w
R14	6.8K Ω "
R15	2.7K Ω "
C1	same as 24v supply
F1	4 amp fuse
ZD1	4.7v 1w
Transformer	12v @ 4 amps
Bridge	same as 24v supply

It should be noted that the 12v version of this power supply has not been built up and therefore the resistance values are theoretical, but they should be within 10% of final values.

D.J.A.

24 VOLT SUPPLY FOR 8" FLOPPY DISK

(will supply up to four 8" drives)

TR1 & TR2 INSULATED.
FROM HEAT SINK.

R1, R2 — 1KΩ ¼ WATT.	TR1, TR2 — 2N3055
R3, R4 — 0·22Ω 5 WATT	TR3 — BD140
R5 — 5·6K ¼ WATT	TR4, TR6 — BC558
R6 — 3·3K ¼ WATT	TR5 — BC548
R7 — 56K ¼ WATT	ZD1 — 1N751A 5·1v ZENER
R8 — 1K ¼ WATT	BR1 — KBPC602
R9 — 1KΩ ¼ WATT	6 AMP BRIDGE.
R10 — 100Ω ¼ WATT	
R11, R12 — 0·1Ω 5 WATT	TRANSFORMER.
R13 — 100Ω ¼ WATT	AR 7311 24V @ 4A.
R14 — 18KΩ ¼ WATT	
R15 — 3·3KΩ ¼ WATT	F1 PCB FUSE HOLDER +
VR1 — 1KΩ TRIM POT	4 AMP FUSE
C1 2500 OR 5600 μFD 40V	MOUNTING HWARE FOR
C2, C3 100 μFD 35 VOLTS.	TR1, TR2.

THE MEETING WAS KAOS

WANTED: KIM and SYM owners to write articles for the newsletter. David Anear opened the meeting and indicated how disappointed he was that KIM and SYM owners had failed to generate any information within the group.

ATARI: Gery McCaughey previewed his DARTS and POOL games in living ATARI colour. The programs come from England and require approximately 24K of Ram to run. At present the games are only available on string or disk. A number of members noted how life like the characters appeared on the screen.

AN ORANGE TODAY KEEPS THE APPLE AWAY: George from COMP-SOFT has indicated that the Asian version of the APPLE is now available in kit form. Contact COMP-SOFT for more information on the ORANGE.

TTY PRINTERS: KAOS have purchased five TTY Printers and they are for sale for approximately $60. David Anear guaranteed them to withstand a direct hit from a 10 Mega ton bomb! With this explosive deal KAOS will throw in one roll of paper (unused). P.S. These are a model 15 teletype and require a 110 VAC power supply. P.P.S. No guarantee on their availablity at the time of printing.

JOY STICK MOUNTS: Now available through KAOS, 4,8 or 10 pound pressure at the incredible cost of $2.60 each. Mounting plate and mount cost approximately $10.

FOR SALE! Advertise in the KAOS newsletter today and try and sell those valuable bits and pieces, ie. software and hardware.

PROBLEMS: It has become evident that a number of people within KAOS are having trouble with the TASKER BUSS expansion system. A little investigation revealed that the power supply was the problem. Remember, one cannot squeeze blood from a stone and the same principal applies to your power supply. Typical problems are poor quality connectors, leads that are too long or too thin. So the moral of the story is, if problems exist, please check your power supply first!

BON VOYAGE: It appear that the TASKER BUSS system will be exported to England in the near future. Good ideas spread fast!

SWITCHABLE SCREEN FORMAT: The video board will plug into the 40 pin expansion socket and will provide you with the C1P screen format or switch-able C4P 32X32 or 64X32 screen format. The double sided through hole plated board will be available in the near future at an approximate cost of $30. The video board will certainly be a welcomed add on and I would personally like to thank the hardware committee for the hours of hard work and sleepless nights spent on the many projects you have seen and will see in the future.

WHAT'S NEW: 1. The 6502C 4MHz processor from COMP-SOFT
              2. Intellivision:- A video game that contains a 16 bit processor and can be expanded to interface with a keyboard. Available from LOOKY VIDEO for around $359.
              3. KAOS have ordered 6502 machine code cards from the States.
              4. Kelvin Eldridge's character generater for the Series 2 computer.

SCREEN DRIVER: Tony and George demonstrated to the meeting their new monitor which can replace your existing monitor. It will be available on disk or eprom in the near future.

HI-RES BOARD DEMO: David Anear's Hi-Res board was a real winner. Using the 6847 chip reduced the total number of IC's to 20. The board has sixteen modes of operation and also has other features, such as reverse video.

HARD WORK: That's what keeps KAOS going, so during the September meeting, the members present showed their appreciation of the hard work Rosemary and Ian Eyles have done for the group, by making them honorary members of KAOS. Tony Durrant forwarded the motion and the meeting was unanimous in their decision. Well done Rosemary and Ian.

Well, that's what happened at the September meeting folks! I think? Please note that any prices mentioned are only a rough guide and are not binding.

73's from Melbourne

Rod Drysdale
VK3BYU

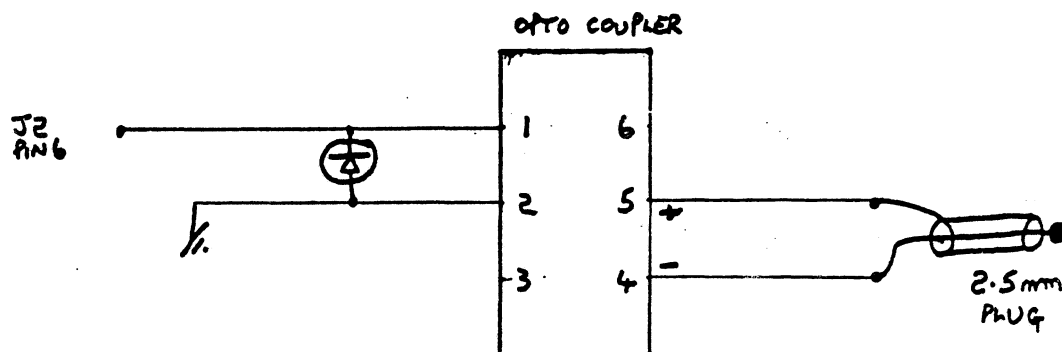+++

CASSETTE MOTOR CONTROL

The circuitry shown below is a simple answer to the control of the cassette motor and only adds one TTL load to the system.
The same commands apply as for the reed switch:-

    POKE 61440,81   to turn the motor on.
    POKE 61440,17   to turn the motor off.

Ray Richards

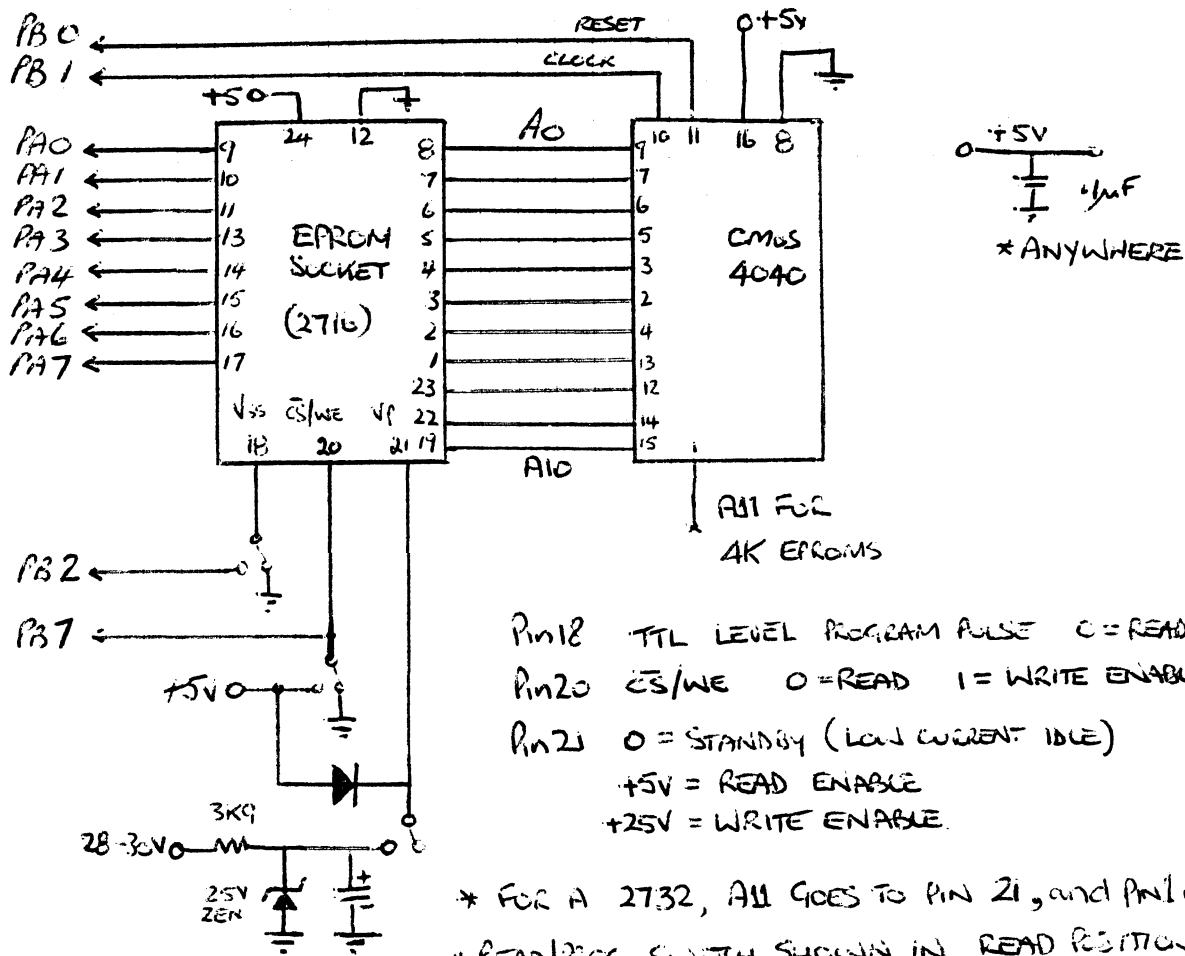.+.

If two programs are loaded into machine and both have data and the second program is run first, it will READ the first program's data. To correct this put in a line similar to this before the second program's first READ statement:

5000   DATA5000:READA$:IFA$<>"5000"THEN5000

John Whitehead

PB 0
PB 1
RESET
CLOCK
+5v

PA0 — 9   24 12   8
PA1 — 10   7
PA2 — 11   6
PA3 — 13 EPROM 5
PA4 — 14 SOCKET 4
PA5 — 15 (2716) 3
PA6 — 16   2
PA7 — 17   1

A0

10 11 16 8

CMOS
4040

Vss CS/WE Vp
18   20   21 19
23
22

A10

PB 2
PB 7
+5v

3KΩ
28-30v
25v ZEN

A11 FOR
4K EPROMS

+5V
.1µF
* ANYWHERE

Pin 18 TTL LEVEL PROGRAM PULSE 0 = READ
Pin 20 CS/WE 0 = READ 1 = WRITE ENABLE
Pin 21 0 = STANDBY (LOW CURRENT IDLE)
        +5V = READ ENABLE
        +25V = WRITE ENABLE

* FOR A 2732, A11 GOES TO PIN 21, and PIN 1 of 4040
* READ/PROG SWITCH SHOWN IN READ POSITION
* AN ON/OFF SWITCH SHOULD ALSO BE USED (NOT SHOWN)
* SWITCH ON PIN 18 IS OPTIONAL
* 2716 CAN BE READ WITH +25V APPLIED
* USE PB7 (or PB6) FOR TESTING SWITCH
  POSITION — PROGRAMMING EASE — USE A 'BIT' TEST

SIMPLE EPROM PROGRAMMER

by Tony Van Bergen

Do you have an EPROM board and an I/O board? If so, then this simple EPROM Programmer may be of interest to you. Using only one I.C. (a CMOS 4040) it can easily be built on a small piece of Vereboard and housed almost anywhere. It only requires a latching 8-bit port and 3 or 4 I/O lines (depending on how sophisticated you wish it to be).

HOW IT WORKS

The 4040 is a 12-bit binary CMOS counter (so apply all the necessary T.L.C. due to a CMOS circuit), which is reset and advanced under software control. In a typical program cycle, the computer sets the I/O lines to all outputs (except for PB7), then writes a 1 on port PB0 then resets PB0 to 0. Port A then latches the first byte of data, PB2 is set to 1, held for 50ms, then reset to 0. PB1 is set to 1, then reset, which causes the 4040 to advance its' binary count by one. The program tests for the last byte, and gets another byte if it's not the last one. The software involved can be as simple or as complex as you wish and can be changed as often as you can write programs!

My software (after exterminating many bugs) includes the following:
T   :Tests the EPROM to see if it is clear
C   :Counts discrepancies between a set area of memory and the EPROM
D   :Dumps errors in the format ADDR-MEMORY BYTE-EPROM BYTE
RE   :Reads the contents of EPROM into memory
PROG   :Burns the contents of memory into the EPROM then counts any errors
X   :Exits from EPROM programmer back to Extended Monitor

ERASING EPROMS

Place the uncovered EPROM approx. 1" (sorry, 2.54cm) from an ultra-
violet lamp for about 30 minutes, then test to see if it's erased. Only
certain UV lamps radiate the required 2537 Angstroms. One suitable
source is a Philips TUV15W fluorescent tube (which fits into a standard
20W fitting). It costs about $20 (tube only) and can be obtained through
LAWRENCE AND HANSEN electrical wholesale shops. But ring the head office
in Sth Melbourne first to see if they have stock, as the 7 suburban stores
don't normally hold stock. Always use the UV carefully as it is very
harmful to the eyes and skin. It's not the same UV that they have at discos
and other such functions!

So what's your first program to burn? Your new M/L renumberer, or
that beaut Space Invaders program you have always wanted instantly?

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FLOPPY ADJUSTMENTS
by D.J.Anear

Anyone building a floppy board will need to know the adjustment
procedure used by OSI to set up their floppy disk controller.

TEST EQUIPMENT REQUIRED:-

One good quality cathode ray oscilloscope (CRO) of at least 10MHz
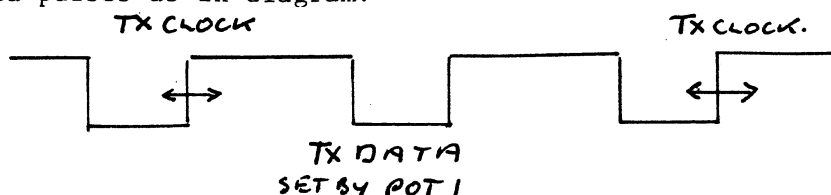band width. Clip leads.

PROCEDURE:-

Remove floppy ACIA and PIA before adjustments. Locate the appropriate
pot by using the layout diagram provided, which shows the pot layouts for
the OHIO boards, plus the Tasker Buss boards. 505B boards must have floppy
cable and drive connected, all others remove drive and cable.

TX DATA PULSE   POT 1:-

Place CRO lead on pin 9 of the molex connector going to the drive.
Adjust pot 1 for -VE pulse width of 250ns for 8" drives and 350ns for
5 1/4" drives.

TX CLOCK PULSE   POT 2:-

Ground pin 6 of the ACIA socket, connect scope to pin 9 of the molex
connector and adjust pot 2 for 250ns (8") or 350ns (5 1/4") negative pulses.
NOTE that this signal is a combined TX clock and TX data stream. As you
have already adjusted the TX data pulse, adjust the TX clock pulse to match
the TX data pulses as in diagram:-

NOTE the next two adjustments will require those people using a Tasker 48 Buss
disk board to bridge out their onboard data separators at A-A and B-B to
allow these adjustments. (Remove link AA and BB and rejoin link A and link B.)
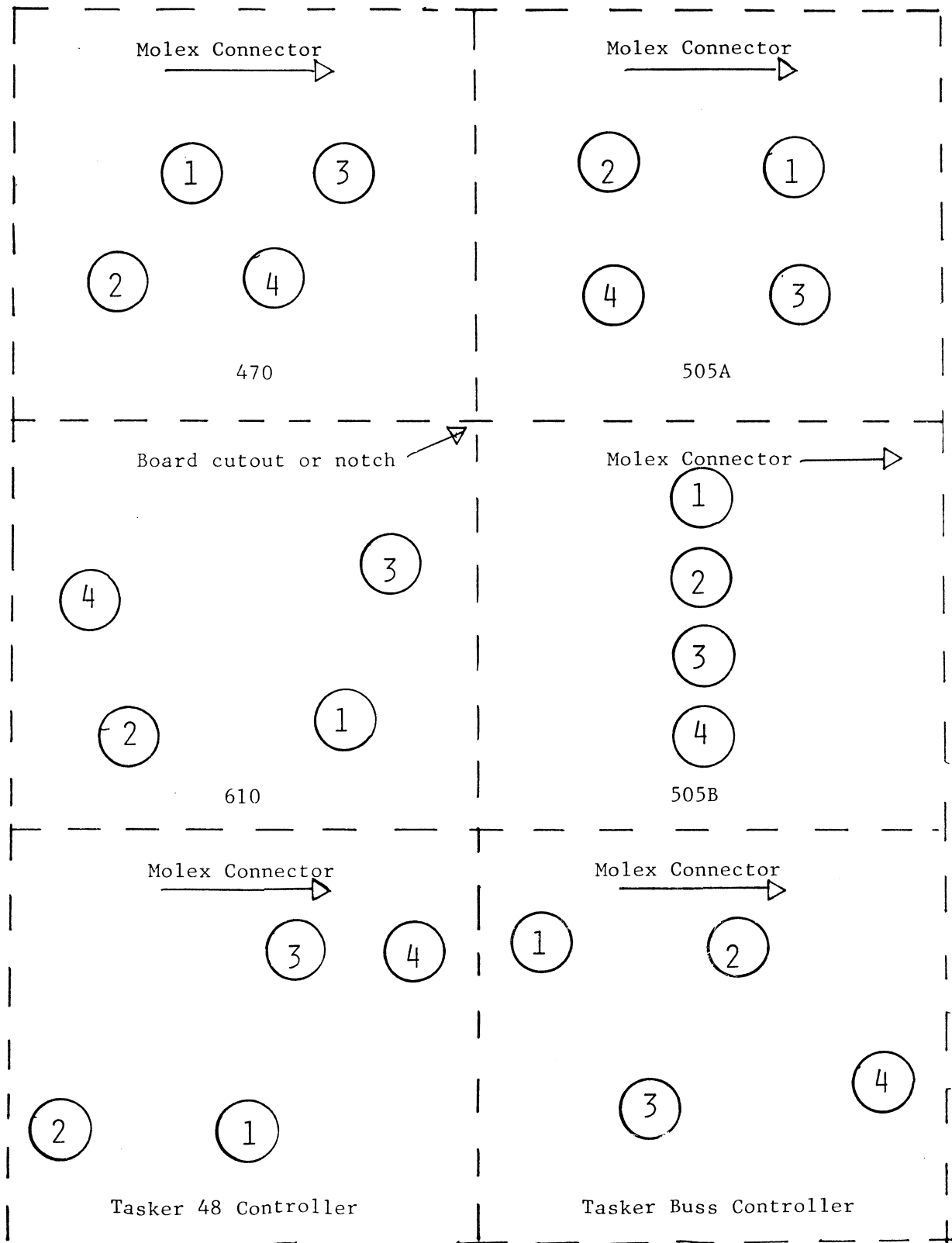
7

RX CLOCK   POT 3:-
    Join pins #9 and pins #10 on the molex connector from drive together
with clip lead. Connect scope to pin 3 of ACIA socket. Adjust pot 3 for
positive pulse of 1 uS for both 8" and 5 1/4" drives.

RX DATA   POT 4:-
    Join pin #9 to pin #11 on molex connector and scope pin 2 of ACIA
socket. Adjust pot 4 for negitive pulse of 2.5uS for 8" drives and 6uS for
5 1/4" drives. Restore all links and replace ACIA and PIA.

(1) TX DATA   (2) TX CLK   (3) RX CLK   (4) RX DATA

Yet a another month has gone by and GTBUG is still not in the shops. Whilst apologizing profusely, we are going to cover our embarassment this month by giving some of the reasons why.

Firstly, we grossly underestimated the amount of work involved and also our (my) own level of ignorance. Secondly whilst it was relatively easy to get the screen driver to work in a fixed enviroment, it has proved much harder to get it to work with all the other software, each of which has it's own quirks. Finally, sheer space has been a big problem.

It is this space problem that is currently causing the delay. In order for GTBUG to be made available in monitor form on as many machines as possible, it has to share a 2K ROM with the 65V Monitor, the Polled Keyboard routine, the reset Boot, and finally either Basic-in-Rom Support or the Disk Boot.

This has only been achievable by rewriting each of these pieces of software in an attempt to shorten them. This was something we never really intended getting involved in but nevertheless we now understand them and have shorter versions which work as well if not better than OSI versions. On top of this advantage, we are now in a position to write boots, monitors and IO drivers for just about anything and these can reside in ROM on bootup.

George now has GTBUG running in ROM at F800 on his rather non standard C1P/C8P/MF/DF Disk system (SUPER-Superboard). Although this seems to be relitively bug free a couple of the features need to be and will be improved.

WORKING features:-
A. Two modes of operation TYPEMODE and LINEMODE giving full page or line buffering until ENTER or C/R respectively. Can switch modes at any time.
B. Whilst buffering cursor control gives left or right movement within line or page. When in LINEMODE motion stops at start of line marker at one end and generates an automatic line enter when it hits the end of line marker at the other. In TYPEMODE cursor can be moved freely in any direction, rolling round lines and scrolling both up and down.
C. Cursor up and down reinstates cursor at the BEGINNING of the prior or next logical line when in LINEMODE. In TYPEMODE the cursor moves from one line to the next without any sideways motion.
D. Character Insert/Delete is done at the cursor for a line in either mode. Other lines are moved up or down as necessary.
E. Line Insert/Delete is achieved by scrolling the part of the screen below the current line. The cursor remains at the same spot and only characters to the right of the cursor will be scrolled.
F. Single Key provided by simultaneous use of ESC and the correct key. ie. like shift or control.
G. Proper keyboard shift decoding. Control function work in any shift.
H. C/R clears to end of logical line.
I. Language buffer overflow catered for during line or page enter by automatic character delete at end of line.
J. Logical or physical screen clear options.
K. All of the above available from keyboard or by PRINT CHR$ in BASIC or LDA#,JSR..... in MACHINE CODE PROGRAMS.
L. With four POKE instructions a screen "window" can be provided anywhere within the physical screen RAM.
M. Graphics characters can be output at current cursor position by a POKE followed by a PRINT CHR$(RMOVE).
N. Tab feature for assembler comments.
O. Cursor Home and to line beginning.

FEATURES not available yet in the 2K version but intended.
A. Cursor positioning through ESCape X,Y sequence.
B. The ability to switch to a third mode which behaves exactly like OSI
   standard for programs where GTBUG causes serious incompatability.
C. Flashing cursor.
D. A generalized TAB set/clear feature for comprehensive TAB control.

FEATURES to be provided in the 4K versions eventually.
A. GLOBAL FIND/REPLACE feature independant of language processor.
B. Resequence capability, again independant of language processor.
C. Block relocation of lines.
D. Includes of other files or parts of.

      Some of these last features are very speculative and may only be
possible on DISK systems. In any event they will be a long time coming.

      Finally we will finish with some, as yet, unsolved problems.
1. Because the aim has been to provide GTBUG with absolutely no changes
   required to existing language processors, it behaves strangely in the
   following circumstances.
   A. CR-CR-LF clears the line on GTBUG but not on standard OSI. Only the
      65D DOS does this. A patch in BEXEC* can fix this.
   B. CR-LF-LF results in a misleading line being left on the screen. This
      occurs in the ASSEMBLER when say, P 100 is done in the middle of a
      screen line.
   C. Prompts (ie. "." in assembler ";" in extended monitor) and five digit
      sequence numbers make editing difficult. Messy solution is to go into
      type mode, more type cursor to left into position 0,0 and then go
      into line mode. Now the cursor can be moved down through the screen
      with LF to move each of the large sequence numbers over one place.
All of these problems can be eliminated if we get rid of language processor
prompts.

      We are very keen to get feedback so ring George or myself with solutions
to any of the above. Obviously, the first GTBUGs will get free reburns for
bug fixes. We want to keep the price of the 2K version below $30 for club
members. Preliminary release is just possible by the next meeting but no
promises.

                                             Tony Durrant

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                              ATARI   NEWS

      Welcome to the second edition of ATARI news. As you may have noticed,
there is a lot of confusion on the price of the ATARI 400. FUTURETRONICS
have had them advertised for $539. Well, the only way you would get one
at that price is for one to fall off the back of a truck, or catch George
after a few too many. The recommended retail price is $699, so drop a
couple cases of booze down to COMP-SOFT and keep your fingers crossed.

      Although ATARI in America, run a very good User Group support program,
and they will bend over backwards to help any User Group, one small problem
is that they don't like sending any information to Australia. Maybe they've
shot thru to South America with the Eighty Bucks we sent for information
manuals that they sell.

WHAT'S NEW
      There is a new disk drive about to hit the U.S. market. It's the
ATARI 817, I think. I've not heard much about it yet but it will be a lot
faster (hooray). Other than that, nothing else is known about it.

                                  10

A fast formatting rom is on the black market in the States, it's for the 810 disk drive. The 817 will have it in. If you want one, give me a call and I will let you know where to get your hands on them. Up to two weeks ago, ATARI were sueing a couple of poor innocents that happened to find some lying on the street. It now seems that they have dropped the law suits.

By the time you read this ASTROIDS and MISSILE COMMAND will be released by FUTURETRONICS. The release of the 16K microsoft basic is very close. It has been completed and is awaiting documentation. It is not a rewrite of Microsoft for the ATARI, but a new generation of basic. PILOT is also very close, it's for dum dums like me who have trouble with basic.

We now have the complete A.C.E. library. It is a full ten disks of games and utilities, two miscellaneous disks and two Forths. These will be available to the members of the ATARI section of KAOS at a very low cost.

As of this month, we have a new contributor to this column. His name is John Lemic and he is the technician at FUTURETRONICS. He has supplied us with information regarding the extra features of the ATARI 400/800 PCS (PAL).
EXTRA FEATURES:

PROCESSOR: In PAL version ATARI are using 6502C microprocessor which
                  turns at 3MHz compared to the AMERICAN NTSC version which
                  runs at 2MHz.

GRAPHICS: In PAL version ATARI are using GTIA I.C. which provides
                  6 extra graphics modes which gives it a total of 14 graphics
                  modes.
                  However, only 3 extra graphics modes can be accessed
                  through the current operating system.

GRAPHICS MODE:	9	10	11
RESOLUTION:	80 x 192	80 x 192	80 x 192
COLOURS:	1	8	16
INTENSITIES:	16	16	1

                  Graphics modes 9,10,11, can be used the same way as the
                  first 8 modes which are described in BASIC REFERENCE MANUAL.

Anybody interested in the Melbourne ATARI Group, please contact me on 481 2215. Maybe when we get a few more members, ATARI might have the courtesy to reply to us, but going on past form, I doubt it. If it wasn't for the help from John Lemic at FUTURETRONICS, I would have traded my ATARI in for (God forbid) an APPLE. (Go and wash your mouth out. (Ed.))

                                              Gerry McCaughey

+++
                    MEDIUM RESOLUTION GRAPHICS[1]

     If you have a Superboard Series II you will know that using the
standard 24 x 24 screen gives you true block graphics of 48 x 24 or
24 x 48 using the full and half block characters. The next best
method was to use Paul Dodds' Hi Res Graphics (Vol 1, No. 5) to give
pseudo 48 x 48 (Pseudo because the three quarter block character does
not exist). With a modification almost as simple as the DABUG one
you can now have true block graphics of 96 x 48.

     The modification is to replace the 2K character ROM with a 4K
character EPROM (Available from me) which uses the lower 2K for the
standard character set and the upper 2K for the graphics character set.
The upper 2K is selected by one bit of the colour RAM enabling the

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graphics characters on a character by character basis.   (If you have a Series I machine you could use the RTS line as described in last months newsletter to switch between the two character sets.)

There are a number of benefits that can be made by doing this modification:

1/ You get good graphics for a very cheap price. The price will be about $25 for the chip and documentation for the Series II machines.

2/ Actual block graphics resolution will depend on your monitor. To calculate the resolution it is the characters across x 4 and characters down x 2.   For example I get 27 characters across and 29 down giving a resolution of 108 x 58.   This now means that the graphics is similar enough to those Z80 based machines that it is possible to easily convert some of their software.

3/ If you have wanted to have an alternative character set then this mod   will allow you to insert your own EPROM and by having in the lower 2K the OSI character set you will not lose OSI software compatability.

4/ If you have a 48 x 30   screen format you will have a block graphics resolution of 192 x 60 which is very impressive.

Provided in the documentation are BASIC routines to plot and unplot any point along with some examples of use.

SOFTWARE:

So far there are two additional software products available for ·purchase.   The first is a machine language routine that sits at the top of memory (8K machines but can be changed to suit the machine if required) and is called by a BASIC program.   The routine allows you to: plot, unplot or read a point; draw or remove a line and three screen set up routines.   Two for graphics only and one for graphics with a four line text window.   As an extra bonus the logic for the line draw and remove routines is based on a 256 point line making it easily adapted to Davids' Hi Res board.   The machine code routine has been converted to a BASIC program which is simply loaded and run.

The second piece of software is the game of WORM.   The idea behind worm is to manoeuvre the worm and catch the ever elusive fly. The more flies you catch the longer the worm grows.   This game uses the machine language routines.

The price of these are: Machine Code routine in
                            BASIC with Documentation. $7

                            Worm $5

NOTE: All products have to be ordered so allow time.   They will also be shown at the KAOS meetings so that you can check out the goods before you decide to buy.

                                        Kelvin Eldridge.